

## Claims

1. A HCCI fuel or fuel component, which fuel includes at least n-paraffins and iso-paraffins having from 7 to 14 carbon atoms, and which fuel has an ignition delay of  
5 less than 7 ms, according to ASTM D6890.
2. A fuel as claimed in claim 1, which fuel contains less than 1% wt of aromatic and negligible levels of sulphur.
- 10 3. A fuel as claimed in any one of the preceding claims, which fuel has an ignition delay of less than 5 ms.
4. A fuel as claimed in any one of the preceding claims, which fuel has an ignition delay of between 2 and 5 ms.
- 15 5. A fuel as claimed in any one of the preceding claims, wherein the mass % of the n-paraffins exceeds that of any other single component in the fuel.
6. A fuel as claimed in any one of the preceding claims, wherein the mass % of  
20 the n-paraffins is in excess of 25% by mass of the fuel
7. A fuel as claimed in any one of the preceding claims, wherein the mass % of the n-paraffins is in excess of 50% by mass of the fuel.
- 25 8. A fuel as claimed in any one of the preceding claims, wherein the mass % of the n-paraffins is in excess of 80% by mass of the fuel.
9. A fuel as claimed in any one of the preceding claims, wherein the mass % of the n-paraffins is in the order of 95% by mass of the fuel.
- 30 10. A fuel as claimed in any one of the preceding claims, wherein the n-paraffins are Fischer-Tropsch (FT) reaction derived n-paraffins.

11. A fuel as claimed in any one of the preceding claims, wherein the iso-paraffins are FT reaction derived iso-paraffins.
12. A fuel as claimed in any one of the preceding claims, which fuel includes one or  
5 more of: olefins, lubricity improver, and oxygenates.
13. A fuel as claimed in any one of claims 1 to 11, which fuel is substantially free of heteroatoms such as nitrogen, sulphur and oxygen.
- 10 14. A fuel as claimed in any one of the preceding claims, which fuel has an ASTM D86 distillation range from 90°C to 270°C.
- 15 15. Use of an HCCI fuel or fuel component as claimed in any one of claims 1 to 14 as a blending component with conventional fuel.
16. A process for preparing a HCCI fuel or fuel component, which fuel or fuel component includes at least n-paraffins and iso-paraffins, which fuel has an ignition delay of less than 7 ms, said process including one or more steps selected from:
- 20 a) hydrotreating at least a Condensate fraction of a Fischer-Tropsch (FT) synthesis reaction product, or a derivative thereof;
- b) hydroconverting a Wax fraction of the FT synthesis product or a derivative thereof;
- 25 c) fractionating in a single unit or in separate units, one or more of the hydrotreated Condensate fractions of step a) and the hydroconverted fraction of step b) to obtain the desired HCCI fuel or fuel component; and
- d) optionally, blending two or more of said components from step c) in a desired ratio to obtain the desired HCCI fuel.
17. A process as claimed in claim 16, wherein the hydroconversion is by way of  
30 hydrocracking.

18. A process as claimed in claim 16 or claim 17, wherein the blending of step d) is the blending of FT condensate derivative and hydroconverted FT wax derivative in a blending ratio of from 1:99 to 99:1 by volume.
- 5 19. A process as claimed in any one of claims 16 to 18, wherein the fuel produced by the process is a fuel as claimed in any one of claims 1 to 14.
20. A HCCI fuel or fuel component as claimed in claim 1, substantially as herein  
10 described and illustrated.
21. A process as claimed in claim 16, substantially as herein described and  
15 illustrated.
22. A new HCCI fuel or fuel component, or a new process substantially as herein described.